

CLAIMS

1. A moulding composition, comprising:

a plurality of bead polymers dispersed in at least one matrix polymer;

wherein the bead polymers:

have an average particle size of 5 to 40 μm , and

have a refractive index n_D at 20°C which is different from a refractive index n_D at 20°C of said matrix polymer;

and wherein the bead polymers are prepared by a process, comprising:

contacting:

at least one polymerizable mix which comprises at least 50% by weight of at least one (meth)acrylate monomer,

at least one aluminum compound, and

an aqueous phase,

to prepare a mixture;

dispersing said mixture at a shear rate $\geq 10^3 \text{ s}^{-1}$ to form a dispersion, wherein said dispersion is stabilized by said aluminum compound; and

polymerizing to produce said bead polymers having an average particle size of 5 to 40 μm .

2. The composition according to Claim 1, wherein said aluminum compound is $\text{Al}(\text{OH})_3$.

3. The composition according to Claim 1, wherein said aluminum compound is $\text{Al}(\text{OH})_3$, and the process further comprises preparing the $\text{Al}(\text{OH})_3$ by precipitation.

4. The composition according to Claim 1, wherein the concentration of the aluminum compound, based on the weight of the polymerizable mix, is 0.5 to 200% by weight.

5. The composition according to Claim 1, wherein the concentration of the aluminum compound, based on the weight of the polymerizable mix, is 3 to 100% by weight.

6. The composition according to Claim 1, wherein the concentration of the aluminum

compound, based on the weight of the polymerizable mix, is 4 to 20% by weight.

7. The composition according to Claim 1, wherein the bead polymers have an average particle size of 5 to 20 μm .

8. The composition according to Claim 1, wherein the bead polymers comprise at least 60% by weight of polymerized (meth)acrylate monomer.

9. The composition according to Claim 1, wherein the polymerizable mix comprises at least 60% by weight of the (meth)acrylate monomer.

10. The composition according to Claim 1, wherein said mixture further comprises at least one emulsifier.

11. The composition according to Claim 1, wherein said mixture further comprises at least one emulsifier, and wherein the concentration of the emulsifier, based on the weight of the aluminum compound, is 0 to 5% by weight.

12. The composition according to Claim 1, wherein said mixture further comprises at least one emulsifier, and wherein the concentration of the emulsifier, based on the weight of the aluminum compound, is 0.3 to 3% by weight.

13. The composition according to Claim 1, wherein, after the polymerizing, said bead polymers are comprised within a second dispersion, and wherein the process further comprises filtering the second dispersion.

14. The composition according to Claim 1, wherein the matrix polymer is selected from the group consisting of polyalkyl (meth)acrylate, polyacrylonitrile, polystyrene, polyether, polyester, polycarbonate, polyvinyl chloride, and mixtures thereof.

15. The composition according to Claim 1, wherein the difference between the refractive indices is at least 0.01, measured at the Na D line (589 nm) and at 20°C.

16. The composition according to Claim 1, wherein the bead polymers are present in an amount of at least 2% by weight, based on the total weight of the moulding composition.

17. The composition according to Claim 1, which has light diffusion properties.

18. The composition according to Claim 1, which has a transmittance (T) to DIN 5036 of $\geq 72\%$.

19. The composition according to Claim 1, which has a Yellowness Index (YI) to DIN 6167 of $\leq 15\%$.

20. The composition according to Claim 1, which has a halved-energy angle (β) of $\geq 10^\circ$.

21. The composition according to Claim 1, which is in the form of an article having a thickness of 0.5 to 20 mm.

22. An article, comprising the composition according to Claim 1.

23. A method of diffusing light, comprising exposing the composition according to Claim 1 to light.

24. A method of making a light-diffusing article, comprising molding the composition according to Claim 1.